

it differs from the ordinary text-book scarcely expresses the truth of the matter. It is so often found that a new book on physics merely consists of previous works *plus* a few modifications and additions. Here, however, internal evidence makes it perfectly clear from page to page that the author is indeed the author.

The book is a very good one indeed, and should find a large sale among those students of physics who need in a single volume a treatment of the subject rather more than elementary. It is true that in many places the illustrations of physical principles used verge on the ludicrous, and that the mode of expression often seems out of place, but the redeeming feature is that the illustrations are excellent. It may be said, in fact, that by reason of the frequent recourse to everyday occurrences as constituting examples of various physical phenomena this book is chiefly noteworthy. A few of them, notably those connected with physiological processes, may, perhaps, be beyond the average student, but the author has evidently introduced them for the special benefit of students of medicine. One undesirable feature may be mentioned in conclusion, namely, the fact that the author has attempted in several places to conduct algebraic calculations in words instead of symbols, the result being that the reasoning, although correct, is very difficult to grasp.

(4) This is a combined theoretical and practical text-book intended for schools, and to be covered normally on a three-years' course. In most respects it resembles the usual school-book. It is, however, a good plan to describe in one volume the methods of doing experiments and the theoretical treatment of the principles involved.

(5) The author of this book has produced a useful record of much of the experimental work which has been done on electrolysis, and interprets the results upon the theory of ionisation. He claims that the simple theory, although admittedly inapplicable to concentrated solutions, yet may afford a basis to which modifications may be made, just as did Mariotte's and Gay-Lussac's laws for gases. The subject is divided into four sections, namely, the constitution of electrolytes, their conductivity, contact potential, and electrical energy. A considerable number of tables are given recording numerical values of such quantities as heats of ionisation and conductivities of acid solutions of various strengths.

(6) In a book having the reputation of the late Prof. Drude's "Optics," the chief interest in the appearance of the third edition is attached to the modifications and additions introduced. Such a book would be hard to improve, and might easily be spoilt. Prof. Gehrcke has wisely refrained

from making any serious alterations, and the additions are few in number, the principal being a short description of Stokes's theory of aberration and a paragraph or so on the photochemical effect on gases. The treatise is still Drude's "Optics," and will continue to merit the high place it already holds in physical science.

(7) This volume has been written for the use of students of electrical engineering. It consists of the treatment of magnetism and electricity, first of all from the theoretical point of view, and then in connection with its various applications. The mathematical treatment is quite elementary—it is, in fact, based on Deschanel's "Natural Philosophy," so far as the purely theoretical part is concerned, many of the diagrams also being reproduced from that treatise. A series of tables of constants and various questions and exercises add to the value of the book, which appears to be well fitted for its purpose.

OUR BOOKSHELF.

La Cementazione dell' Acciaio. By Dr. Federico Giolitti. Pp. xi+506. (Torino: Unione Tipografico-Editrice Torinese, 1912.)

IN the present work, Prof. Giolitti has collected together the important experimental results obtained by his fellow-workers during the last four years relative to the cementation of steel. At the same time, he has presented an exhaustive review of the subject from its scientific and technical aspects. The chemical nature of the process of cementation (in which term case-hardening is included) has been the subject of many controversies, and it cannot be said that the mechanism of the transport of carbon is even now understood. Prof. Giolitti subjects the extensive literature of the question to a critical review, which does not appear to omit any work of importance, English and German memoirs being examined as thoroughly as those in Italian and French. This part of the book might, perhaps, have been somewhat condensed by the omission of repetitions, but it forms an excellent source of reference for a class of facts of great importance for the general theory of metallic alloys. The chapter in which the results of previous investigations are summed up scarcely gives sufficient attention to the fact, now fully established, that carbon diffuses in the solid as a carbide, and not in the free state.

The author's own researches, which occupy the larger part of the book, deal mainly with the specific influences of carburising gases (hydrocarbons and carbon monoxide, alone or in the presence of solid carbon) in the process of cementation. Details are given of the experimental conditions employed, and of the technical processes based on the experiments. The methods are of great scientific as well as technical interest as examples of the application of a purely physico-chemical study of equilibrium to an industrial

operation. The work is an important and valuable contribution to the literature of metallurgy.

C. H. D.

Index Zoologicus No. II. Compiled (for the Zoological Society of London) by C. O. Waterhouse and edited by David Sharp, F.R.S. Pp. vi+324. (London: Printed for the Society, 1912.) Price 15s.

THE subtitle of this volume describes its scope; it runs: "An alphabetical list of names of genera and subgenera proposed for use in zoology as recorded in the 'Zoological Record,' vols. 38-47 inclusive (1901-1910), and the zoology volumes of the 'International Catalogue of Scientific Literature,' annual issues 1-10, together with other names not included in previous nomenclators." The first volume was published in 1902, and the primary object of the present work is to serve as an index to the intervening ten years, but it is also planned so as to be with Scudder's "Nomenclator" a complete register of the names of genera and subgenera proposed for use in zoology. The editor of this volume points out that 140,000 names have been, up to the present time, proposed for the genera and subgenera of zoological taxonomy.

Systèmes Cinématiques. By Prof. L. Crelier. Pp. 100. (Paris: Gauthier-Villars, 1911.) 2 francs. (*Scientia*. Janvier, 1911. Phys.-Mathématique. No. 31.)

UNDER the above title, the author investigates the motion of a right-angle one side of which passes through a fixed point, while the vertex describes a fixed right line or circle, that of a rod sliding between axes at right-angles, that of a crank connecting rod, and so forth; altogether, six methods of generation are investigated. The curves associated with these moving systems include the base and rolling centrodes or loci of the instantaneous centres, the envelope of the moving line and those of other lines associated with it, the trajectories of various points of the figure, and certain envelopes of their tangents. In this way a large number of curves are obtained, possessing interesting properties; of course, many of these are already well known. The figures in the book are rather complicated. The book contains a portrait of Col. Mannheim and a short bibliography.

Internal Secretion and the Ductless Glands. By Prof. Swale Vincent. With a preface by Prof. E. A. Schäfer, F.R.S. Pp. xx+464. (London: Edward Arnold, 1912.) Price 12s. 6d. net.

PROF. SWALE VINCENT is well known as an investigator who has devoted much attention to one of the most interesting chapters of physiology, namely, that which deals with the group of organs, formerly so mysterious, which are known as the ductless glands. The adrenal bodies, the thyroid and parathyroids, the thymus, the pituitary, pineal, carotid, and coccygeal bodies are the principal ones treated, but, as is well known, internal secretions are also formed by glands which possess ducts, and so we also have chapters on the

pancreas, liver, kidney, and reproductive organs. The literature of the subject is enormous, and in presenting a lucid and terse account of the recent progress of science, and in ferreting out the 3000 or more references which deal with it, the author has, as Prof. Schäfer says in his preface, laid us under a deep debt of gratitude. W. D. H.

A Laboratory Manual of Agriculture for Secondary Schools. By Prof. L. E. Call and E. G. Schafer. Pp. xv+344. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1912.) Price 4s. net.

THIS book is issued to supply the demand that has arisen for laboratory exercises in the teaching of agriculture in the United States. Directly agriculture becomes a school subject (and it is for secondary schools that the book is intended), it becomes necessary that the teacher should be provided with a number of simple experiments within the capacity of the scholars and of the school equipment. Of course, the out-door observations must still remain the essential groundwork of the instruction, but a well-chosen course of laboratory experiments can be arranged to bring out the main principles and illustrate the working of the individual factors involved.

The lessons deal with soils, crops and animals. For convenience of working they are arranged in calendar form, beginning in September and continuing through to May, with an "extra" for Arbor Day. They have actually been carried out in schools, so that they are known to be workable.

The soil experiments deal mainly with the moisture relationships, which in Kansas play a large and sometimes a controlling part in soil fertility. The crops studied include the cereals, cowpeas, cloves, lucerne and potatoes: the exercises range over the germination of the seed, the development of the root and seed, and the examination of the harvest. The animal section is based on the score-card method, devised in America and found so useful that it has been introduced into this country.

Teachers of agriculture will find many useful and suggestive lessons in the book, and it will serve as an excellent example of the standard of instruction aimed at in the American schools.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

An Effect due to the Sudden Great Increase of Pressure.

IN the course of some experiments on the mapping of the lines of electric force between two charged conductors, a remarkable effect, due to the sudden very great rise in pressure in the oil separating them, occurred. The conditions of the experiment necessitated the use of two pointed strips of tinfoil, separated by an interval of 1/16 in., laid on a sheet of glass